# INDICATIONS & CONTRAINDICATIONS OF LOCAL ANESTHESIA

## LEARNING OBJECTIVES

- Ability to use L.A. drug safely through:
- Good planning ahead & history taking
- Knowing well when to use it
- Knowing when to avoid or modify the use
- Weighing the benefits against risks
- Knowing how to anticipate and avoid risks

What do you need from your local anesthetic?

- Specific in action
- Reversible in action
- Active whether applied topically or injected
- Rapid onset
- Suitable duration
- Chemically stable
- Sterilizable without change in properties
- Able to combine with other agents without loss of properties
- Patient Safety Features:

- Non irritant
- No permanent damage
- No systemic toxicity
- Non allergic
- Non addictive

- INDICATIONS OF L.A.

- Diagnostic use
- Therapeutic use
- Perioperative use
- Postoperative use
- Local haemostatic effect

DIAGNOSTIC USE:
- Useful way of finding pain source as in non localized pulpitis

- Myofascial pain

- Trigeminal neuralgia

THERAPEUTIC USE
- Topical anesthesia for  oral ulcerations

- N. blocks for dry socket using L.A.L.A.

- Acute FLARE-UPS in chronic pain syndromes eg.

PERIOPERATIVE USE
- Most common use
- In conjunction with conscious sedation
- In conjunction with general anesthesia which serves 3 purposes:
- Reducing arrhythmias
- Reducing depth of G.A. needed
- Local haemostasis

POSTOPERATIVE USE
- AFTER SURGERY WITH EITHER:

- LOCAL
- GENERAL

LOCAL HAEMOSTASIS:

LOCAL OUTPATIENT BASIS
GENERAL ANESTHESIA BASIS

CONTRAINDICATIONS OF L.A.
PATIENT FACTORS
TREATMENT FACTORS
CONTRAINDICATIONS TO SPECIFIC TECHNIQUES
CONTRAINDICATIONS TO SPECIFIC AGENTS
CONTRAINDICATIONS TO VASOCONSTRICTOR

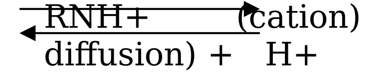
PATIENT FACTORS

- Patient refusing to sign consent
- Very young children
- Dental – phobic patients
- Handicapped people
- Unreasonable individuals

TREATMENT FACTORS

- Time
- Accessibility
- Presence of acute infection
- Epilepsy
- RN HCL + $NaHCO_3$

RN (freeBase) + NaCl + $H_2CO_3$



RNH+ (cation) RN (free active base for diffusion) + H+

CONTRAINDICATIONS TO SPECIFIC TECHNIQUES:

- BLEEDING DISORDERS
- SUSCEPTIBILITY TO ENDOCARDITIS
- TRISMUS

BLEEDING DISORDERS:

HERIDITARY:

- Hemophilia
- Von- Willebrand disease
- Christmas disease
- Purpura

No Paraperiosteal or Block Injections
USE PDL INJECTIONS OR RATHER G.A.

ACQUIRED

- ANTICOAGULANT THERAPY

AS WARFARIN OR DICUMAROL DERIVATIVES

- ALWAYS P.T. SHOULD BE CHECKED??

SUSCEPTIBILITY TO ENDOCARDITIS

- In past years, the American Heart Association has recommended that patients at increased risk for endocarditis take prophylactic antibiotics before certain dental, GI and GU procedures.

- Recently, the American Heart Association's Endocarditis Committee, together with national and international experts on endocarditis, extensively reviewed published studies in order to determine whether dental, GI or GU tract procedures are possible causes of endocarditis.

These experts concluded that there is no conclusive evidence linking dental, GI or GU tract procedures with the development of endocarditis. They also concluded that endocarditis is much more likely to result from frequent exposure to random bacteremias associated with daily activities than from bacteremia caused by a dental, GI or GU tract procedure

- The risk of antibiotic-associated adverse events exceeds the benefit, if any, from prophylactic antibiotic therapy.

- Maintenance of optimal oral health and hygiene may reduce the incidence of bacteremia from daily activities and is more important than prophylactic antibiotics for a dental procedure to reduce the risk of endocarditis

***High-Risk Category: Prophylaxis Recommended***

- Prosthetic cardiac valves
- Previous infectious endocarditis
- Complex cyanotic congenital heart disease
- Cardiac transplantation recipients who develop cardiac valve abnormalities

***Moderate-Risk Category: Prophylaxis Recommended***

- Most other congenital malformations
- Acquired valvular dysfunction
- Hypertropic cardiomyopathy
- Mitral valve prolapse with valvular regurgitation

***Negligible-Risk Category: Prophylaxis NOT Recommended***

- Coronary artery bypass graft (CABG)
- Mitral valve prolapse without regurgitation
- Physiologic, functional, or innocent heart murmur
- Isolated secundum atrial septal defect
- Surgical repair of atrial septal defect; patent ductus arteriosus
- Previous rheumatic fever without valvular dysfunction

***<u>Oral Procedures in which Prophylaxis is Recommended</u>***

- Dental extractions and biopsies
- Periodontal procedures
- Dental implant placement
- Periapical endodontic procedures
- Intraligamentary local anesthetic injections
- Dental prophylaxis when bleeding is expected
- Other procedures causing intraoral bleeding

***<u>Oral Procedures in which Prophylaxis is NOT Recommended</u>***

- Routine local anesthetic injection
- Intracanal endodontic therapy and routine restorative
- Suture removal
- Taking impressions

AVOID PDL.UNLESS ANTIBIOTICS ARE ADMINISTERED PREOPERATIVELY

- TRISMUS:
- TEHCNIQUES WHICH CANNOT BE PERFORMED:
- Inferior alveolar ??
- Palatal injections??

- WHAT SHOLUD BE DONE??

CONTRAINDICATIONS TO SPECIFIC AGENTS:

ALLERGY
MEDICAL CONDITIONS

ALLERGY

- AMIDE GROUP : allergy is very rare (Methyl Paraben)

- ESTER GROUP: PABA

- MANAGEMENT:
- MILD
- MODERATE (EPINEPHRINE)
- SEVERE (EPINEPHRINE)

MEDICAL CONDITIONS

- LIVER DYSFUNCTION
- RENAL  DISEASE
- PATIENTS ON STEROID THERAPY
- METHEMOGLOBINEMIA
- ATYPICAL PSEUDO CHOLINESTERASE
- PREGNANCY

- ELDER PATIENTS

LIVER DYSFUNCTION

- Causes of liver disease:
- Viral hepatitis
- Bilharziasis
- Alcoholism

- Problems with liver disease:
- Protein synthesis albumin level 10-15g daily
- Vitamin K dependent coagulation factors
- Plasma cholinesterase
- Hepatic microsomal enzymes
- Liver enzymes : aspartate aminotransferase (AST, SGOT) – alanine aminotransferase (ALT, SGPT)

- MANAGEMENT:

- Bleeding disorders; IV vit. K (5-10 mg over 3-5 min) will work within 4-12 hours
- Fresh frozen plasma
- Ethanolism
- Viral hepatitis
- Drugs to avoid in severe cases NSAID TETRACYCLINE
- Drugs to be dose modified: diazepam, lidocaine, morphine, theophylline
- GA: most anesthetics are safe however halothane & nitrous oxide should be used cautiously

RENAL DISEASE

- Severe cases only

- Procaine

PATIENTS ON STEROID THERAPY

- Average daily cortisol secretion in adult is 15-17 mg (range 8-28mg)
- Secretion follows diurnal pattern; peaking at 2 3-4 am & falling to low levels at about 8-9 pm
- ACTH
- Surgical stress
- DOUBLING THE CURRENT DOSE
- THE RULE OF TWOS
- Under GA repeat initial shooting dose every 8 hrs then tapered over next 5-7 days
- Anesthesiologist monitor the patient’s blood pressure intraoperatively and be alert to unexpected hypotension

METHEMOGLOBINEMIA

- Methemoglobin:
- Normally 97-99% of iron in Hb is in ferrous state
- Methemoglobin reductase
- Prilocaine administration (byproduct)
- Benzocaine topical application

ATYPICAL PSEUDO CHOLINESTERASE
- Autosomal recessive trait
- About 1 every 2800 persons
- Biotransformation of ester L.A.
- FAMILIAL HISTORY
- PROBLEMS WITH G.A.

PREGNANCY
- Elective VS emergency procedures
- Best trimester
- Local anesthesia :best is lidocaine with adrenaline
- Avoid long procedures
- Proper chair position

ELDER PATIENTS
- STAY WELL BELOW THE MRD

- ASSUME THAT THE ELDER PATIENT HAS A COMPROMISED LIVER, RENAL & CARDIAC CONDITIONS

CONTRAINDICATIONS TO VASOCONSTRICTOR:

- UNTREATED HYPERTHYROIDISM
- A

- CARDIAC INFARCTION WITHIN 6 MONTHS
- A

- HYPERTENSION $\geq$ 200/$\geq$115
- A
- ANGINA: unstable or daily episodes
- A

- CABG: within 6 months
- R

- CVA: within 6 months
- A

- Uncontrolled: heart failure & arrhythmias
- A

- Sulphite-sensitive asthma or true sulphite allergy

- A

- Controlled (under ttt.): angina, hypertension, congestive heart failure, and arrhythmias
- R

- THE AHA PERMITS THE USE OF 0.04 mg of EPINEPHRINE over a ½ hour visit

DRUG INTERACTIONS WITH VASOCONSTRICTOR:

Patients on ß- blockers: eg Inderal
INTERACTION: Increased blood pressure
ACTION: decrease vasoconstrictor dose

- Patients on Tricyclic antidepressants:

Eg: Tofranil, Norpramin, and Aventyl

INTERACTION:Increased blood pressure (9 folds)
ACTION: avoid levonordefrin, Noradrenalin & adrenalin
Use Prilocaine + felypressin
(Citanest,octapressin)

- Patients with drug abuse: eg. cannabis ephedrine, cocaine within the past 24 hrs.

INTERACTION: Additive sympathomimetic effect, severe rise in
Cardiac dysrhythmias
Blood pressure
ACTION: Patient must be free from the drug 24 hrs before using adrenaline

GENERAL ANESTHETICS: Halothane (fluothane). Some anesthetic drugs sensitizes the myocardium to adrenaline
INTERACTION: Drop in systolic blood pressure
Ventricular fibrillation
ACTION: No more than 100 µg adrenaline
(10ml of 1:100000).if adrenaline not advised use felypressin

CONCENTRATION OF VASOCONSTRICTOR:

- 1:100,000 adrenaline means

- 1 gm / 100,000 ml = 1000mg/ 100,000 ml

- As maximum doses should always be presented in mg or more commonly nowadays in µg So.

- 1mg/100ml=0.01mg/ml (0.018mg /1carpule)

- or 10 µg/ml (18µg/1carpule)

MISCELLANEOUS CONTRAINDICATIONS OF VASOCONSTRICTOR

- In irradiated areas
- In patients liable to dry socket
- In intramuscular injections for relieving myofascial pain

DECIDE WHAT U R USING

- Good planning:  facilities, resources, materials
- Thorough history: risk anticipation & action
- Follow indications: do right things right
- Avoid absolute contraindications: do not do wrong things right
- Weigh benefits with relative contraindications: do right compromise right
- Be modest: think of consultation or referral
- Remember: U R not the most knowledgeable

DECIDE WHAT U R USING

Murphy’s law: if things can go wrong, they will

- Lack of anesthetic drugs variety
- Lack of proper relevant history
- Doing wrong things right
- Doing wrong things wrong
- Lack of proper scientific basic  knowledge
- Lack of proper risk anticipation and being ready to act accordingly
- Doing every procedure & not paying attention to qualifications, privileges & specialty